SRM SPOTLIGHT

November 2006 Editor: Regina R. Montgomery

Inside:

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New NIST RMs/SRMs

NIST SRM 2115 Low Energy Izod Impact Specimen

New SRM for the Evaluation of Izod Impact Machines

For many years, the National Institute of Standards and Technology (NIST) has offered Charpy-V Notch SRMs for verifying the performance of an impact machine to the requirements of ASTME 23 "Standard Test Methods for Notched Bar Impact Testing of Metallic Materials." Now, NIST has added Izod verification specimens for machines set up for the Izod test configuration that is also listed in E 23.

SRM 2115 is made from the same 4340 steel used for the Charpy SRMs; however, its dimensions are tuned to the cantilever-beam configuration used in Izod machines. Figure 1 compares the shape of a Charpy specimen (on the left) to an Izod specimen (on the right). The SRM unit consists of five specimens for testing in an Izod machine at room temperature. NIST offers an evaluation service that examines the strike marks on the specimens and compares them to those expected on a properly configured machine. Therefore, the SRM package also contains directions for returning the specimens back to the Izod Program Coordinator at NIST in Boulder, Colorado. NIST will respond with a letter comparing the machine performance to the certified value, and perhaps some suggestions on how to improve the performance of the machine.

Figure 1
Comparison of Izod SRM (2115) on right to Charpy SRM (2092) on left.

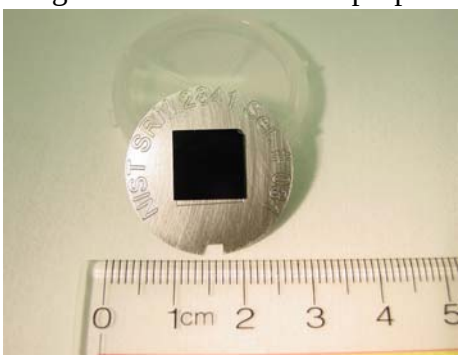
Technical Contact: Tom Siewert
Email: thomas.siewert@nist.gov

NIST SRM 2841 Semiconductor Thin Film: $Al_xGa_{1-x}As$ Epitaxial Layers

New Standard Released for Compound Semiconductor Industry

A wide range of optoelectronic devices, from laser disk players to traffic lights, may be improved in the future thanks to a small piece of semiconductor, about the size of a button, coated with aluminum, gallium, and arsenic (AlGaAs).

The semiconductor piece is made of GaAs with a 3-micrometer thick layer of $Al_xGa_{1-x}As$ deposited on top. The Al mole fraction *x* of the layer has been certified by NIST to within an expanded uncertainty of 0.002 or less. The piece is approximately 1 centimeter square and is mounted to a stainless steel disk for transport and handling. This is the first standard for the chemical composition of thin-film semiconductor alloys issued by NIST. SRM 2841 was requested by the compound semiconductor industry to help measure and control thin film composition as a basis for optimizing material and device properties. The SRM can be used to calibrate equipment for making or analyzing these materials. Potential buyers include companies that grow or characterize thin films or use them to make devices, as well as government and university laboratories. SRM 2841 units have Al mole fraction near 0.20; NIST will also be releasing units of SRM 2842 with Al mole fraction near 0.30 in the upcoming year.



SRM 2841 mounted on a stainless steel handling disk

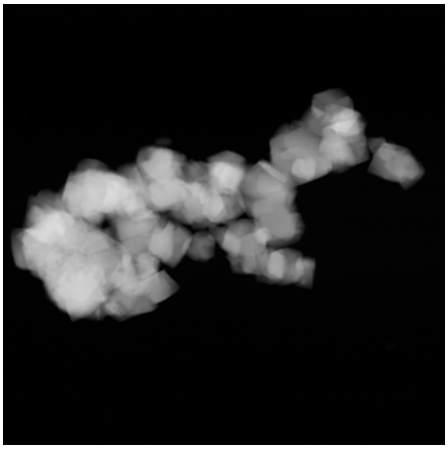
AlGaAs is used as a barrier material to increase conductivity in high-speed circuits for wireless communication; semiconductor lasers for optical disk drives, bar code scanning, xerography, and laser surgery; and light-emitting diodes for remote controls, traffic lights, and medical instruments. The NIST standard is expected to increase the accuracy of chemical characterization of AlGaAs films by an order of magnitude over the current state of the art. Improved accuracy will reduce wasteful duplication of reference wafers, increase the free exchange of thin-film materials between vendors and their customers, and ultimately improve the accuracy of data on relationships between material and composition and properties.

Media Contact: Laura Ost
Email: laura.ost@nist.gov
Technical Contact: Kris Bertness
Email: bertness@boulder.nist.gov

NIST RM 8850 Zeolite Y
NIST RM 8851 Zeolite A
NIST RM 8852 Ammonium ZSM-5

NIST has issued three new reference materials to support researchers studying the properties of commercially important zeolites.

First described in the 18th century, zeolites have seen increasing use in industry and commerce from humble cat litter to industrial catalysts and "molecular sieves." Zeolites belong to a class of materials called "alumino-silicates," whose crystal structures form highly porous, nanoscale "cages" that can filter and trap small molecules. Naturally occurring zeolites are mined and widely used as absorbents in products such as cat litter. Tailored synthetic zeolites have a wide variety of more specialized applications, such as in laundry detergents (where they replace pollution-causing phosphates) and as catalysts in oil refineries. Because they can be designed with pores that pass only molecules of a certain size and shape, zeolites have excited considerable interest as molecular sieves for chemical separations; for example, they are used in oxygen generation systems for medical oxygen.



Zeolite Y

It is often extremely difficult to make precision measurements of key chemical characteristics for zeolites because they are very hygroscopic. Humidity must be specified and controlled to make meaningful measurements of the elemental content, for example. This has made it difficult to compare experimental results between different laboratories.

To provide a common basis for research on three widely used industrial zeolites, NIST has issued reference materials for Zeolite Y (RM 8850), Zeolite A (RM 8851), and Ammonium ZSM-5 Zeolite (RM 8852). While these materials do not come with the certified property values furnished with NIST Standard Reference Materials (SRMs), these RMs do provide a common source of zeolite materials for measurement comparisons. Reference and information values are provided for major and trace element content, key atomic ratios, enthalpy of formation, unit cell parameters, and particle size distributions.

Media Contact: Michael Baum
Email: michael.baum@nist.gov
Technical Contact: Shirley Turner

X-Ray Film Step Tablet SRM 1001 and Photo Step Tablet SRM 1008 Diffuse Transmittance Standards to be Discontinued and Replaced by Calibration Services

Standards for diffuse visual transmission density, SRM, 1001 and SRM 1008, are being converted to Calibration Services to better serve customers needs. SRM 1001 is primarily used for quality control in nondestructive testing (NDT) of metal welds and castings by x-rays. Similarly, SRM 1008 is used for quality control in dosimetry and imaging. Both SRMs are used to calibrate densitometers for these applications. The densitometers provide quantitative readings of the optical density (OD) of the exposed monochrome film for assessing dosage or exposure level or for determining the quality of the film development process.

The new Calibration Services,

38100C X-Ray Film Step Tablet Transmission Density Standard
38110C Recalibration of an X-Ray Film Step Tablet Transmission Density Standard
38120C Photographic Film Step Tablet Transmission Density Standard
38130C Recalibration of a Photographic Film Step Tablet Transmission Density Standard,

include opportunities for recalibration (38110C and 38130C) for customers interested in directly assessing drift in their optical density scales using a single artifact. Recalibrations would also allow NIST to better understand the stability of the standards when used in an industrial environment. Recalibration services 38110C and 38130C are available immediately. The other two services, 38100C and 38120C, will be available upon depletion of the present stocks of SRM 1001 and SRM 1008, respectively.

Gerald T. Fraser Leader, Optical Thermometry and Spectral Methods Group, Optical Technology Division

Renewals

SRM 1650b Diesel Particulate Matter
SRM 2745 Carbon Dioxide in Nitrogen Lot #9-C-XX
SRM 2765 Propane in Air Lot #2765-A-XX
SRM 3109a Calcium Standard Solution Lot #050825
SRM 3126a Iron Standard Solution Lot #051031
SRM 3132 Manganese Standard Solution Lot #050429
SRM 3183 Fluoride Anion Standard Solution Lot #050721
SRM 3185 Nitrate Anion Standard Solution Lot #050517
SRM 3190 Aqueous Electrolytic Conductivity (25 µS/cm)
SRM 3193 Aqueous Electrolytic Conductivity (1000 µS/cm)
SRM 3241 *Ephedra sinica* Stapf Native Extract
SRM 3242 *Ephedra sinica* Stapf Commercial Extract
SRM 3245 Ephedra Dietary Supplement Suite

Revisions

Certificate Revisions—Are You Using These Materials?

This is a list of our most recent certificate revisions. Users of NIST SRMs should ensure that they have the most recent certificates. NIST updates certificates for a variety of reasons, such as to extend the expiration date or to include additional information gained from stability testing. If you do not have the most recent certificate for your material, you can print or view a copy from the website at:
http://www.nist.gov/srm
or contact SRM at:
Phone: (301) 975-6776
Fax: (301) 926-4751
Email: srminfo@nist.gov.

SRM 956b Electrolytes in Frozen Human Serum
Addition of the certified value for chloride

SRM 966 Toxic Metals in Bovine Blood
Editorial Changes

SRM 968c Fat-Soluble Vitamins, Carotenoids, and Cholesterol in Human Serum
New Expiration Date:
30 September 2008

SRM 1241c Aluminum Alloy 5182
Editorial Changes

SRM 1589a PCBs, Pesticides, PBDEs, and Dioxins/Furans in Human Serum
Values added for the PBDE congeners;
New Expiration Date:
31 March 2012

SRM 1616b Sulfur in Kerosene (Low Level)
Editorial Changes

SRM 1617a Sulfur in Kerosene (High Level)
Editorial Changes

SRM 1685b Nitric Oxide in Nitrogen
Lot #43-K-XX
New Expiration Date:
01 July 2012

SRM 1686b Nitric Oxide in Nitrogen
Lot #42-L-XX
New Expiration Date:
01 July 2012

SRM 1951b Lipids in Frozen Human Serum
Editorial Changes
New Expiration Date:
31 December 2010

SRM 2631a Nitric Oxide in Nitrogen
Lot #47-F-XX
Editorial Changes

SRM 3154 Sulfur Standard Solution
Lot # 892205
Editorial Changes;
New Expiration Date:
18 August 2010

SRM 3156 Tellurium Standard Solution
Lot #892901
Editorial Changes
New Expiration Date:
01 April 2010

SRM 3182 Chloride Anion Standard Solution
Lot #990506
New Expiration Date:
24 September 2007

SRM 3183 Fluoride Anion Standard Solution
Lot #050721
Editorial Changes

Order NIST SRMs Online

You can now order NIST SRMs through our new online ordering system, which is constantly being updated. This system is efficient, user-friendly and secure. Our improved search picks up keywords on the detail page along with the words in the title of each SRM.

In addition, we are in the midst of a project to add numerous certificate references for each SRM online. Please also note we are adding many historical archive certificates online for your convenience.

https://srmors.nist.gov

Please Register Your Certificate Online!

Users of NIST SRMs should ensure that they have the most recent certificates.

http://www.nist.gov/srd/srmregform.htm

Coming Soon - SRM 2007 MARKETING CATALOG/CD

If you would still like a copy of our January 2006 SRM Marketing or Technical Catalogs on CD, please call, fax, or email us at:

Ph: 301-975-6776/2200
Fax: 301-948-3730
Email: **srminfo@nist.gov**.

These CDs are helpful to SRM users who do not have access to our online catalog on the Internet.

NIST SRM 2006/2007 Exhibit Schedule

Eastern Analytical Symposium (EAS)
November 13-16, 2006
Convention Center
Somerset, NJ

Material Research Society Fall Meeting
November 27-30, 2006
Hynes Convention Center
Boston, MA

American Academy for Forensic Science (AAFS)
February 20-25, 2007
Henry B. Gonzalez Convention Center
San Antonio, TX

Pittsburgh Conference (PITTCON)
February 25- March 2, 2007
McCormick Place
Chicago, IL

American Chemical Society (ACS)
March 26-28, 2007
McCormick Place
Chicago, IL

CBD-IAI Forensics
March 30-31, 2007
Rocky Gap Resort
Cumberland, MD

NOBCChE
April 1-7, 2007
J.W. Marriott Resort
Orlando, FL

AACC-Clinical Lab Expo (AACC)
July 15-19, 2007
San Diego Convention Center
San Diego, CA

IFT-Food Expo
July 26-30, 2007
McCormick Place
Chicago, IL

NCSL Symposium
July 29-August 2, 2007
St. Paul River Centre
Minneapolis, MN

American Chemical Society (ACS)
August 20-22, 2007
Boston Convention Center
Boston, MA

AOAC Annual Meeting (AOAC)
September 16-20, 2007
Hyatt Regency Orange County
Anaheim, CA

MS&T-Materials Science & Technology
September 17-20, 2007
COBO Hall
Detroit, MI

Chem Show
October 30-November 1, 2007
Javits Convention Center
New York City, NY